General

Guideline Title

Breast cancer screening for women at average risk: 2015 guideline update from the American Cancer Society.

Bibliographic Source(s)

Oeffinger KC, Fontham ET, Etzioni R, Herzig A, Michaelson JS, Shih YC, Walter LC, Church TR, Flowers CR, LaMonte SJ, Wolf AM, DeSantis C, Lortet-Tieulent J, Andrews K, Manassaram-Baptiste D, Saslow D, Smith RA, Brawley OW, Wender R, American Cancer Society. Breast cancer screening for women at average risk: 2015 guideline update from the American Cancer Society. JAMA. 2015 Oct 20;314(15):1599-614. [122 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version:

Smith RA, Saslow D, Sawyer KA, Burke W, Costanza ME, Evans WP 3rd, Foster RS Jr, Hendrick E, Eyre HJ, Sener S. American Cancer Society guidelines for breast cancer screening: update 2003. CA Cancer J Clin. 2003 May-Jun;53(3):141-69. [184 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

Definitions for the strength of the recommendations (Strong Recommendation or Qualified Recommendation) are provided at the end of the "Major Recommendations" field.

American Cancer Society (ACS) Guideline for Breast Cancer Screening, 2015

These recommendations represent guidance from the ACS for women at average risk of breast cancer: women without a personal history of breast cancer, a suspected or confirmed genetic mutation known to increase risk of breast cancer (e.g., *BRCA*), or a history of previous radiotherapy to the chest at a young age.

The ACS recommends that all women should become familiar with the potential benefits, limitations, and harms associated with breast cancer screening.

Recommendations

Women with an average risk of breast cancer should undergo regular screening mammography starting at age 45 years. (*Strong Recommendation*)

Women aged 45 to 54 years should be screened annually. (*Qualified Recommendation*)

Women 55 years and older should transition to biennial screening or have the opportunity to continue screening annually. (*Qualified Recommendation*)

Women should have the opportunity to begin annual screening between the ages of 40 and 44 years. (*Qualified Recommendation*)

Women should continue screening mammography as long as their overall health is good and they have a life expectancy of 10 years or longer. (*Qualified Recommendation*)

The ACS does not recommend clinical breast examination for breast cancer screening among average-risk women at any age. (*Qualified Recommendation*)

Definitions

Interpretation of Strong and Qualified Recommendations by Users of the Guideline

	Strong Recommendations	**Qualified Recommendations**
For patients	Most individuals in this situation would want the recommended course of action, and only a small proportion would not.	The majority of individuals in this situation would want the suggested course of action, but many would not. Patient preferences and informed decision making are desirable for making decisions.
For clinicians	Most individuals should receive the recommended course of action. Adherence to this recommendation according to the guideline could be used as a quality criterion or performance indicator.	Clinicians should acknowledge that different choices will be appropriate for different patients and that clinicians must help each patient arrive at a management decision consistent with her or his values and preferences. Decision aids may be useful to help individuals in making decisions consistent with their values and preferences. Clinicians should expect to spend more time with patients when working toward a decision.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Breast cancer

Guideline Category

Screening

Clinical Specialty

Family Practice

Internal Medicine

Obstetrics and Gynecology

Oncology

Preventive Medicine

Intended Users

Advanced Practice Nurses

Health Care Providers

Health Plans

Managed Care Organizations

Nurses

Patients

Physician Assistants

Physicians

Public Health Departments

Guideline Objective(s)

To update the American Cancer Society (ACS) 2003 breast cancer screening guideline for women at average risk for breast cancer

Target Population

Women at average risk of breast cancer

Interventions and Practices Considered

1. Screening mammography at annual or biennial intervals
2. Clinical breast examination for screening (not recommended)

Major Outcomes Considered

Critical Outcomes

Breast cancer mortality (breast cancer deaths prevented by screening)
Quality of life (quality-adjusted life-years gained by screening)
Life expectancy (life-years gained by screening)
False-positive findings (recall for additional testing [imaging and/or biopsy] after abnormal clinical breast examination or mammography, in which further evaluation determines that the initial abnormal finding was not cancer)
Overdiagnosis (screen-detected cancers that would not have led to symptomatic breast cancer if undetected by screening)
Overtreatment (cancer therapies [surgery, radiation, chemotherapy] performed for screen-detected cancers that would not have led to symptomatic breast cancer if undetected by screening)

Important But Not Critical Outcomes

Breast cancer stage (tumor characteristics at diagnosis, including stage, tumor size, and nodal status)
Short- and long-term emotional effects (anxiety, depression, quality of life associated with positive results)

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The American Cancer Society (ACS) Guideline Development Group (GDG) selected the Duke University Evidence Synthesis Group to conduct an independent systematic evidence review (see the "Availability of Companion Documents" field) of the breast cancer screening literature, after a response to a request for proposals. In addition, the ACS commissioned the Breast Cancer Surveillance Consortium (BCSC) to update previously published analyses related to the screening interval and outcomes. The ACS Surveillance and Health Services Research Program provided supplementary data on disease burden using data from the Surveillance, Epidemiology, and End Results (SEER) Program.

Parameters of Review

With input from the ACS and GDG, the reviewers developed specific key questions (KQs) relevant to breast cancer screening and specified patients, interventions, comparators outcomes, timing, and settings (PICOTS) for each question (see Box 1 in the original guideline document). In their review, they focused on the results for women at "average" risk for breast cancer, defined as the absence of a known susceptibility gene mutation (e.g., *BRCA1/BRCA2*); history of previous breast cancer or ductal carcinoma in situ (DCIS); family history of breast cancer; or history of lobular neoplasia, proliferative lesions on prior biopsy, or chest irradiation. Abstracts and full-text articles were screened for descriptions of the subject population and excluded if women at higher risk were either exclusively included or explicitly included but results not reported separately. Population-based studies that did not report results separately were not excluded. The review reports on results for KQ 1 (mammography screening vs no screening), KQ 2 (mammography screening at different intervals), and KQ 3 (clinical breast examination [CBE] with or without mammography). The review identified almost no evidence relevant to KQ 4 (screening vs no screening in women at high risk of breast cancer) or KQ 5 (screening at different intervals for high-risk women).

Search Strategy

The reviewers searched PubMed (to March 6, 2014), CINAHL (to September 10, 2013), and PsycINFO (to September 10, 2013). No earlier date limit was used for randomized clinical trials (RCTs); for observational studies, the group searched for all citations published after January 1, 2000. "Gray literature" was not searched nor were attempts made to identify unpublished studies. An experienced search librarian advised on all searches. Exact search strings are included in in eAppendix 1 in the systematic review supplement (eTables 1, 2, and 3). Hand searches of 4 systematic reviews of RCTs and 3 systematic reviews of observational studies were performed to ensure that all these studies were included. All citations were imported into an electronic database (EndNote X4; Thomson Reuters) that was also used for recording screening decisions and data extraction.

Study Selection

The reviewers developed specific inclusion/exclusion criteria (see Box 2 in the systematic review) that were used by 2 investigators to independently review titles and abstracts for potential relevance to the KQs. Articles included by either reviewer underwent full-text screening. At the full-text review stage, paired researchers independently reviewed the articles and indicated a decision to "include" or "exclude" the article for data abstraction. When the 2 reviewers arrived at different decisions about whether to include or exclude an article, they reconciled the difference through review and discussion, or through a third-party arbitrator if needed. Full-text articles meeting the eligibility criteria were included for data abstraction.

Refer to the "Search Results" section of the systematic review for a discussion on the results of the literature search.

Number of Source Documents

After applying inclusion/exclusion criteria, 160 articles representing 93 studies passed full-text screening and were included for abstraction. See Figure 2 in the Duke evidence synthesis report for a literature flow diagram (see the "Availability of Companion Documents" field).

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Overall Quality of the Body of Evidence Using Grading of Recommendations Assessment, Development and Evaluation (GRADE)

High — The reviewers are very confident that the true effect lies close to that of the estimate of the effect. (Alternative: Further research is very unlikely to change confidence on the estimate of effect.)

Moderate — The reviewers are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of effect, but there is a possibility that it is substantially different. (Alternative: Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.)

Low — Confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the effect. (Alternative: Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.)

Very low — The reviewers have very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect. (Alternative: Evidence on an outcome is absent or too weak, sparse, or inconsistent to estimate an effect.)

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The American Cancer Society (ACS) Guideline Development Group (GDG) selected the Duke University Evidence Synthesis Group to conduct an independent systematic evidence review (see the "Availability of

Companion Documents" field) of the breast cancer screening literature, after a response to a request for proposals. In addition, the ACS commissioned the Breast Cancer Surveillance Consortium (BCSC) to update previously published analyses related to the screening interval and outcomes. The ACS Surveillance and Health Services Research Program provided supplementary data on disease burden using data from the Surveillance, Epidemiology, and End Results (SEER) Program.

Prior to the review, the GDG had agreed to use the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework to assess quality of evidence and resulting certainty or uncertainty about benefit and harm to formulate specific recommendations. Decisions about which outcomes were "critical" in the context of GRADE (e.g., all false-positive results vs false-positive biopsy results) were made by the GDG.

Data Abstraction

Based on clinical and methodological expertise, a pair of investigators were assigned to abstract data from each eligible article. One investigator abstracted the data, and the second reviewed the completed abstraction form alongside the original article to check for accuracy and completeness. Disagreements were resolved by consensus or by obtaining a third reviewer's opinion if consensus could not be reached. In addition to specific study characteristics, individual study limitations (risk of bias) were rated using a 4-point scale from very low to high quality using the GRADE methodology.

Qualitative Evidence Synthesis

The reviewers summarized results and methodological limitations of included studies, noted qualitative patterns or inconsistencies, and identified common themes and potential explanations for observed patterns or inconsistencies.

Quantitative Evidence Synthesis

Four high-quality systematic reviews or meta-analyses published within the past 4 years have synthesized the available data, particularly for breast cancer mortality, and have reported roughly similar results. Prior to beginning their review, the Evidence Synthesis Group planned to conduct a new meta-analysis only if any additional literature was substantially different in results from previous studies or would substantively improve the ability to grade the quality of evidence for a particular outcome (because it would substantially improve the precision of the estimate of association with harm or benefit). As of March 6, 2014, no updated evidence from included studies, new evidence from other studies, or new evidence for outcomes not amenable to quantitative synthesis in previous reviews (such as overdiagnosis) were identified, and it was judged that additional meta-analyses would not substantially help the GDG resolve uncertainties about the evidence.

Absolute associations of screening (particularly mortality reduction and cumulative false-positive rates) were estimated using both the results of simulation-based modeling reported in the literature and results of simpler models (see eAppendix 2 in the systematic review supplement). Published population-based data on incidence, mortality, and survival, screening prevalence, and estimates of false-positive outcome were used. To estimate the absolute reduction in mortality associated with screening over 15 years, the reviewers used an approach similar to that of a previous model (see eAppendix 2 in the systematic review supplement), based on estimates of prevalence of screening, the mortality reduction associated with screening (across a wide range of estimates), and observed mortality. However, in contrast to the previous approach, the reviewers used age-specific incidence-based mortality rather than age-specific mortality. Because breast cancer deaths at a given age reflect cases diagnosed both at that age and younger ages, estimating the effects of screening using this approach will not capture the potential effect of screening prior to the beginning of a given age interval (for example, applying a given risk reduction associated with mammography to 50- to 59-year-old women will include deaths attributable to cancer diagnosed prior to age 50 years). Using incidence-based mortality results in somewhat lower estimates of number needed to screen (NNS), compared with age-specific mortality at a given estimate of screening effectiveness.

Overall Quality Rating

The reviewers graded the overall quality of the body of evidence for each outcome per Key Question (KQ) based on the specific criteria outlined by GRADE (see eAppendix 1 in the systematic review supplement [eTables 5 and 6]). There is no explicit "formula" for grading strength of evidence when data are available from both randomized controlled trials (RCTs) and observational studies, particularly when, as is the case with breast cancer screening, differences exist in the magnitude of association across different study designs and factors other than study internal validity or risk of bias, such as secular trends in incidence, screening technology, and treatment effectiveness, may influence the applicability of the evidence to the population of interest. For each outcome per KQ, the Evidence Synthesis Group provided an assessment of the overall strength of evidence across all included study designs by assessing 4 domains: (1) risk of bias (graded primarily by study design, with RCTs having the lowest risk of bias, and, within study designs, by factors such as method of randomization, adequacy of adjustment for potential confounding, and plausible direction of unmeasured confounding); (2) consistency (graded primarily on consistency in the direction of association—e.g., did studies consistently show a reduction in breast cancer mortality across a range of study designs and settings); (3) directness (graded based on whether the study directly measured the outcome of interest, rather than a direct measure of a surrogate or an estimate of the outcome based on the modeling of surrogates, and by applicability to screening as currently practiced in the United States); and (4) precision, which primarily affected the estimate of the magnitude (strength) of association—for example, it would be possible for evidence for a particular outcome to be considered high quality in terms of consistency if all studies showed the same direction of association (e.g., decreased breast cancer mortality) but low quality for the magnitude of association if results varied substantially within or across study designs or settings. If available, results from meta-analyses were used when evaluating consistency (forest plots, tests for heterogeneity), precision (confidence intervals), and strength of association (weighted mean difference). These domains were considered qualitatively, and a summary rating of high, moderate, low, or very low strength of evidence was assigned after discussion by 2 investigators using a 4-level scale from high to very low. Any disagreement was resolved through consensus.

Much of the available evidence on the outcomes of specific screening strategies, particularly for the United States, is derived from published studies of simulation modeling. GRADE does not provide explicit guidance on how to weight modeling studies. Even the most sophisticated modeling study will be limited by the strength of the evidence available for the most important parameters. In general, because modeling is often most useful for addressing questions for which direct evidence is difficult to obtain (comparing a large number of different screening intervals and starting and stopping ages), and because virtually all models require assumptions or imputed values (such as the progression rate of undetected cancer) to produce usable results (such as estimates of cancer deaths prevented). Therefore, the Evidence Synthesis Group assumed that modeling studies could be no higher than moderate quality. As part of the total body of evidence, modeling studies raised quality if they contributed to improved consistency of results (e.g., if model-based estimates of mortality reduction were consistent with observational studies that were not used to provide inputs into the model).

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The Process

In accordance with the new guideline development process, the American Cancer Society (ACS) organized an interdisciplinary Guideline Development Group (GDG) consisting of clinicians (n=4), biostatisticians (n=2), epidemiologists (n=2), an economist (n=1), and patient representatives (n=2). After evaluating available methods to grade the evidence and the strength of recommendations, the GDG selected the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system. GRADE is an accepted approach with a defined analytic framework, an explicit consideration of values and preferences

addressing patient-centered outcomes, the capacity for flexibility in evaluating results from observational studies, and separation between quality of evidence and strength of recommendation.

The ACS GDG selected the Duke University Evidence Synthesis Group to conduct an independent systematic evidence review of the breast cancer screening literature, after a response to a request for proposals. This effort is referred to as the evidence review. In addition, the ACS commissioned the Breast Cancer Surveillance Consortium (BCSC) to update previously published analyses related to the screening interval and outcomes. The ACS Surveillance and Health Services Research Program provided supplementary data on disease burden using data from the Surveillance, Epidemiology, and End Results (SEER) Program.

The GDG deliberations on the evidence and framing of the recommendations were guided by the GRADE domains: the balance between desirable and undesirable outcomes, the diversity in women's values and preferences, and confidence in the magnitude of the effects on outcomes. The GDG chose to assess recommendations as "strong" or "qualified," in accordance with GRADE guidance. A strong recommendation conveys the consensus that the benefits of adherence to the intervention outweigh the undesirable effects. Qualified recommendations indicate there is clear evidence of benefit but less certainty about either the balance of benefits and harms, or about patients' values and preferences, which could lead to different decisions (see the "Rating Scheme for the Strength of the Recommendations" field).

The GDG members voted on agreement or disagreement with each recommendation and on the strength of recommendation. A record of the vote with respect to each question was made without attribution. The panel attempted to achieve 100% agreement whenever possible, but a three-quarters majority was considered acceptable.

Rating Scheme for the Strength of the Recommendations

Interpretation of Strong and Qualified Recommendations by Users of the Guideline

	Strong Recommendations	Qualified Recommendations
For patients	Most individuals in this situation would want the recommended course of action, and only a small proportion would not.	The majority of individuals in this situation would want the suggested course of action, but many would not. Patient preferences and informed decision making are desirable for making decisions.
For clinicians	Most individuals should receive the recommended course of action. Adherence to this recommendation according to the guideline could be used as a quality criterion or performance indicator.	Clinicians should acknowledge that different choices will be appropriate for different patients and that clinicians must help each patient arrive at a management decision consistent with her or his values and preferences. Decision aids may be useful to help individuals in making decisions consistent with their values and preferences. Clinicians should expect to spend more time with patients when working toward a decision.

Cost Analysis

The evidence review team excluded studies reporting economic outcomes only. The guideline developers considered the Grading of Recommendations Assessment, Development and Evaluation (GRADE) domains of the balance between desirable and undesirable patient important outcomes, the diversity in women's values and preferences, and confidence in the magnitude of the effects on outcomes. Resource use and cost were not factors in decisions about recommendations.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Prior to submitting the final guideline for publication, 26 relevant outside organizations and 22 expert advisors were invited to participate in an external review of the guideline. Responses were documented and reviewed by the Guideline Development Group (GDG) to determine if modifications in the narrative or recommendations were warranted.

The American Cancer Society (ACS) Mission Outcomes Committee and Board of Directors reviewed and approved the guideline. Final decisions were the responsibility of the GDG.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

Studies were included in the evidence synthesis if they met the following inclusion criteria:

> Controlled studies, including randomized controlled trials (RCTs), pooled patient-level meta-analyses, systematic reviews, and study-level meta-analyses.
> Observational studies (prospective and retrospective cohort studies, incidence-based mortality studies, case-control studies, or cross-sectional studies) published since 2000 that included 1000 or more average-risk women.
> Modeling/simulation studies, because these studies may be the only way to generate estimates of long-term outcomes associated with screening that are not adequately addressed by the RCTs or using modern technology and protocols.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Mammography screening has been shown to be associated with a reduction in breast cancer mortality across a range of study designs, including randomized controlled trials (RCTs) and observational studies (trend analyses, cohort studies, and case-control studies), with most studies demonstrating a significant benefit (see Table 3 in the original guideline document for a table of estimated relative reduction in breast cancer mortality associated with mammography screening, by study design among pooled studies).

Potential Harms

- False-positive findings are common in breast cancer screening. The most common outcome of a false-positive finding is being recalled for additional imaging.
- While the Guideline Development Group (GDG) recognizes that overdiagnosis represents the greatest possible harm associated with screening because it would result in overtreatment, uncertainty about the magnitude of the risk of overdiagnosis poses a challenge to providing complete and accurate information to women about what to expect from breast cancer screening.
- When making decisions on screening intervals, it is important to consider the harm-benefit trade-off. While annual screening yielded a larger reduction in breast cancer mortality than biennial screening,

a more frequent screening schedule also resulted in a higher rate of false-positive findings.
- Women in poor health or with severe comorbid conditions and limited life expectancy may be more vulnerable to harms of screening, including anxiety and discomfort associated with additional testing and risk of overdiagnosis (due to increased risk of dying from non–breast cancer–related causes) as well as to harms from breast cancer treatment. Thus, health and life expectancy, not simply age, must be considered in screening decisions.

Qualifying Statements

Qualifying Statements

The American Cancer Society (ACS) had an advisory role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, and approval of the manuscript; and decision to submit the manuscript for publication.

Limitations

There are invariably gaps between the available evidence and the evidence needed for the development of guidelines that precisely quantify and weigh the benefits vs the harms associated with breast cancer screening. The Guideline Development Group (GDG) synthesized evidence from a variety of sources, including the randomized controlled trials (RCTs), observational studies of modern service screening, and modeling studies. Still, even after broadening the evidence base, gaps remain. Empirical comparisons of screening programs that differ in terms of their ages to start and stop screening, and in their intervals between screening examinations, generally were lacking. Further, most breast screening studies did not provide estimates of benefits and harms over a lifetime horizon, which is important when considering policies that will span several decades or more of an individual's lifetime. The value and applicability of meta-analysis of mammography screening RCTs to guide current health policy also should be kept in perspective. While the RCT evidence demonstrated the efficacy of mammography screening, these studies were conducted from the 1960s through the 1990s with varying protocols, most using older screen-film systems and often using single-view mammography. The RCTs demonstrated a range of outcomes in terms of mortality reductions and, importantly, in terms of the degree to which an invitation to screening was associated with a reduced risk of being diagnosed with an advanced breast cancer, which is strongly associated with reduced breast cancer mortality. Overall and age-specific mortality reduction estimates derived from meta-analysis of intention-to-treat results do not reveal these differences in the performance of the trials. In addition, RCT estimates based on intention-to-treat analyses are influenced by nonadherence to the protocol by both the invited and control group. In these respects, meta-analysis results are a sound basis for judging the efficacy of mammography screening, but a poor basis for estimating the effectiveness of modern high-quality screening, especially when calculating absolute benefits and harms.

Refer to the "Limitations" section of the original guideline document for additional discussion.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Patient Resources

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Oeffinger KC, Fontham ET, Etzioni R, Herzig A, Michaelson JS, Shih YC, Walter LC, Church TR, Flowers CR, LaMonte SJ, Wolf AM, DeSantis C, Lortet-Tieulent J, Andrews K, Manassaram-Baptiste D, Saslow D, Smith RA, Brawley OW, Wender R, American Cancer Society. Breast cancer screening for women at average risk: 2015 guideline update from the American Cancer Society. JAMA. 2015 Oct 20;314(15):1599-614. [122 references] PubMed

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2015 Oct 20

Guideline Developer(s)

American Cancer Society - Disease Specific Society

Source(s) of Funding

Funding/Support

The American Cancer Society (ACS) supported the development of this guideline through the use of general funds. Dr. Oeffinger was supported in part through a Cancer Center Support Grant from the National Institutes of Health/National Cancer Institute (P30 CA008748).

Guideline Committee

Guideline Development Group (GDG)

Composition of Group That Authored the Guideline

Authors: Kevin C. Oeffinger, MD; Elizabeth T. H. Fontham, MPH, DrPH; Ruth Etzioni, PhD; Abbe Herzig, PhD; James S. Michaelson, PhD; Ya-Chen Tina Shih, PhD; Louise C. Walter, MD; Timothy R. Church, PhD; Christopher R. Flowers, MD, MS; Samuel J. LaMonte, MD; Andrew M. D. Wolf, MD; Carol DeSantis, MPH; Joannie Lortet-Tieulent, MSc; Kimberly Andrews; Deana Manassaram-Baptiste, PhD; Debbie Saslow, PhD; Robert A. Smith, PhD; Otis W. Brawley, MD; Richard Wender, MD

Members of the American Cancer Society Guideline Development Group (GDG): Timothy R. Church, Ruth Etzioni, Christopher R. Flowers, Elizabeth T. H. Fontham, Abbe Herzig, Samuel J. LaMonte, James S. Michaelson, Kevin C. Oeffinger, Ya-Chen Tina Shih, Louise C. Walter, Andrew M. D. Wolf. (The Breast Cancer Screening Subgroup included Kevin C. Oeffinger, Elizabeth T. H. Fontham, Ruth Etzioni, Abbe Herzig, James S. Michaelson, Ya-Chen Tina Shih, and Louise C. Walter.)

Financial Disclosures/Conflicts of Interest

All participants in the guideline development process were required to disclose all financial and nonfinancial (personal, intellectual, practice-related) relationships and activities that might be perceived as posing a conflict of interest in development of the breast cancer screening guidelines. The chairpersons of the American Cancer Society (ACS) Guideline Development Group (GDG) had the responsibility to ensure balanced perspectives were considered in deliberations and decision making. In addition to the disclosures listed below, nonfinancial disclosures of the authors are reported in the supplemental online content (see the "Availability of Companion Documents" field).

Conflict of Interest Disclosures

All authors have completed and submitted the International Committee of Medical Journal Editors (ICMJE) Form for Disclosure of Potential Conflicts of Interest.

Dr. Etzioni reported owning stock in Seno Medical Instruments. Dr. Michaelson reported receiving compensation for consulting on lawsuits involving delay in the treatment of cancer from CRICO Medical Insurance Company, University of Missouri, PPIC Medical Insurance Company, NORCA Mutual Insurance Company, MCIC Vermont Insurance Company, the law office of Hart Warner, Ford, Parshall & Baker, Haut & Marsh, Newber Pepe & Monteith, Meredith, Wildberger & Brennan, and Offutt Nord Burchett, Barger & Wolen, and receiving grant funding from Nikon. Dr. Flowers reported receiving compensation as a consultant to Spectrum, Celgene, Optum Rx, and Seattle Genetics; serving as an unpaid consultant to Genentech/Biogen-Idec/Roche, and Millennium/Takeda; receiving compensation for development of educational presentations from Clinical Care Options, Educational Concepts, PRIME Oncology, and Research to Practice; and his institution receiving research funding from AbbVie, Acerta, Celgene, Gilead Sciences, Infinity Pharmaceuticals, Janssen Pharmaceutical, Millennium/Takeda, Spectrum, Onyx Pharmaceuticals, and Pharmacyclics. Dr. Smith reported serving as an unpaid advisor on General Electric Health Care's Breast Medical Advisory Board in 2015, to provide advice on appropriate implementation of technology in low- and middle-income countries.

No other disclosures were reported.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version:

Smith RA, Saslow D, Sawyer KA, Burke W, Costanza ME, Evans WP 3rd, Foster RS Jr, Hendrick E, Eyre HJ, Sener S. American Cancer Society guidelines for breast cancer screening: update 2003. CA Cancer J Clin. 2003 May-Jun;53(3):141-69. [184 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the Journal of the American Medical Association (JAMA) Web site .

Availability of Companion Documents

The following are available:

- Breast cancer screening for women at average risk: 2015 guideline update from the American Cancer Society. Supplemental online content. 2015 Oct. 6 p. Available from the Journal of the American Medical Association (JAMA) Web site .
- Myers ER, Moorman P, Gierisch JM, Havrilesky LJ, Grimm LJ, Ghate S, Davidson B, Montgomery RC, Crowley MJ, McCrory DC, Kendrick A, Sanders GD. Benefits and harms of breast cancer screening. A systematic review. JAMA. 2015 Oct 20;314(15):1615-34. Available from the JAMA Web site .
- Systematic review of cancer screening literature for updating American Cancer Society breast cancer screening guidelines. Durham (NC): Duke Evidence Synthesis Group; 2014 Dec 5. 481 p. Available from the American Cancer Society (ACS) Web site .

In addition, a continuing medical education (CME) activity is available for subscribers to the JAMA Web site .

Patient Resources

Patient education resources concerning breast cancer including prevention and early detection, treatment, support and research are available from the American Cancer Society (ACS) Web site .

NGC Status

This NGC summary was completed by ECRI on March 12, 1999. The information was verified by the guideline developer on February 28, 2000. This summary was updated by ECRI on July 21, 2003. The updated information was verified by the guideline developer on August 13, 2003. This summary was updated by ECRI Institute on February 4, 2008. The updated information was verified by the guideline developer on February 29, 2008. This summary was updated again by ECRI Institute on January 12, 2016. The updated information was verified by the guideline developer on February 5, 2016.

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content as follows: (Breast Cancer Screening for Women at Average Risk: 2015 Guideline Update From the American Cancer Society, Oeffinger KC. et al. JAMA. 2015;314(15):1599-1614. doi:10.1001/jama.2015.12783).

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